

ABSTRACT

An apparatus for noninvasively monitoring the flow and/or the composition of a flowing liquid using ultrasound is described. The position of the resonance peaks for a fluid excited by a swept-frequency ultrasonic signal have been found to change 5 frequency both in response to a change in composition and in response to a change in the flow velocity thereof. Additionally, the distance between successive resonance peaks does not change as a function of flow, but rather in response to a change in composition. Thus, a measurement of both parameters (resonance position and resonance spacing), once calibrated, permits the simultaneous determination of flow 10 rate and composition using the apparatus and method of the present invention.